

In the United States Patent and Trade Mark Office  
Moulded Thermoplastic Articles and Process for making them  
Serial No. 10/530,964 – ColorMatrix Europe Limited

Declaration under Rule 132

I, Mark Frost of Churchdale Hall, Ashford in the Water, Bakewell, Derbyshire, DE45 1NX, United Kingdom, do declare as follows:

1. I am over 21 years of age and am competent to give this Declaration. The information contained in the Declaration is based on my personal knowledge and experience.
2. I hold a degree in Chemical Engineering from Birmingham University, United Kingdom and a Masters in Business Administration from the Manchester Business School. I am currently Global Development Director of ColorMatrix Group Inc, a role that I have held for the last five years. Prior to this, I was responsible for Technology Development in ColorMatrix Europe Limited. With ColorMatrix, I have had 15 years experience in the polyester industry in general and in the last nine years much of my focus has been on the development of novel additives for PET containers. I have been an inventor on several patents and developed extensive know-how in this area.
3. ColorMatrix is the largest global supplier of colorants to the polyester beverage container market and my position as Technical Leader of the company has provided me with a depth of knowledge and experience in the methods, materials and processes for coloration of polyester.
4. I have read the Office Action dated 29 March 2010 and, in particular, the Examiner's discussion of US6423764 (Zhao). In particular, I note that the Examiner points out "if the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process". The Examiner points out that "although produced by a different process, the burden shifts to the applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product".
5. I also note that, under point 6 in the "Response to arguments" section of the referenced Office Action, the Examiner points out that applicant has not provided any evidence to support the assertion that "a product produced by melt processing plastic and colorant would be different from a product produced by contacting the plastic with disperse dye in a liquid medium...". The present declaration addresses this point and provides relevant evidence.

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6. Zhao is, according to its title, concerned with a "Method of producing coloured polyester thermoplastic materials through specific solid state procedures". The description of the invention at column 2, line 65 to column 3, line 12 reads as follows:

"Accordingly, this invention encompasses a method for producing colored polyester thermoplastic or resinous articles comprising the sequential steps of a) providing a molten uncolored resin; b) introducing said resin of step "a" into a pre-pellet formation device, optionally with at least one coloring agent; c) forming pellets of said resin of step "b", and optionally coating said pellets with at least one coloring agent; d) introducing the pellets of step "c" into a solid stating vessel, optionally with at least one coloring agent; and e) molding the colored solid stated polyester of step "d" into a polyester article; wherein a coloring agent is added in at least one of steps "b", "c" or "d"."

7. It is important to note from the quoted passage that a coloring agent is "added in at least one of steps b, c, or d". Thus, it is clear that the coloring agent is added prior to molding.

8. Furthermore, the examples in the Zhao reinforce the fact that colorant is added prior to molding. In particular, referring to column 7, line 50 et seq, base pellets are compounded with coloring agent. The material is then solid stated, prior to injection molding into test plaques.

9. In my interpretation of Zhao, it is inevitable that the colorant will be distributed throughout the PET polymeric material by virtue of the processes to which the colorant is subjected – i.e. melt processes such as injection moulding. This means that the colorant will be intimately mixed with the PET polymer and homogenously distributed throughout the polymer. Thus, the density of colorant throughout the polymer will be the same throughout the polymer and the density of colorant at all surfaces will be the same.

10. The colored material of Zhao will differ significantly from the colored material described in the claims of the present application. According to the present application, a process is used to produce an article which involves contacting a container or container preform with "one or more disperse dyes in the liquid medium for a period of time between 10 seconds and 15 minutes, after which time the container or preform is removed from the liquid medium".

11. I am familiar with the process described in the claim of the present application and can confirm that it would not be possible to produce a homogeneous material as described in Zhao wherein colorant is distributed throughout the polymeric material, by following the steps described in the claim. In particular, it will not be possible to produce such a homogeneous material, using a disperse dye, wherein the container or container preform is only contacted with the disperse dye for a period between 10 seconds and 15 minutes. This is because polymeric materials, such as polyethylene terephthalate, do not absorb disperse dyes like a "sponge", but disperse dyes very gradually migrate into the material. Over the time period referred to in the claim, the disperse dye will only penetrate the surface of the container or preform a few microns.

12. The Examiner has also cited US6393803 (Luka). Nonetheless, the Examiner has acknowledged that Luka does not specifically disclose that the colourant has a chemical affinity for polyethylene terephthalate. Luka discloses coatings which are cured and bonded to a preform. The only example of such a coating is described at column 4, line 9 as a "barrier material such as an epoxy-amine". Such a material differs significantly from disperse dyes referred to in claims of the present application. In epoxy-amine systems, an epoxy and amine react with one another under heat to form an extended, durable, three-dimensional network. This may adhere to an underlying substrate. In contrast, disperse dyes have a specific chemical affinity for PET meaning that they penetrate a short distance into the PET. Thus, whereas the coatings of Luka cover PET of a container and define a separate layer, the disperse dyes migrate into the PET which gives more depth to the colour, making it resemble a preform made by a conventional process which involves injection moulding a mixture of PET and colour to produce a preform as described in the present published specification US2006105128 at [0007]. The process of the present invention can readily be used to tint (and/or provide a hint of colour) to a preform in contrast to the coating of Luka.

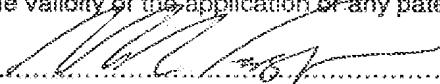
13. Furthermore, since the disperse dyes of the present invention are not chemically reacted such as by being cross-linked or otherwise forming new covalent bonds, they can readily be removed in a recycling process allowing a coloured PET bottle to be treated to remove the colour and then the resulting colourless bottle can be recycled. In contrast, the invention and effect of Luka is to produce a coating which is cured and new covalent bonds are formed such as in an epoxy-amine coating, thereby to produce a durable coating which is not intended to be readily removed as for example may be desired in recycling.

14. Thus, Luka does not disclose the specific, advantageous, disperse dyes (a particular class of dyes) described in accordance with the present invention. Thus, the present invention is clearly not anticipated by Luka.

15. I also do not believe the present invention is obvious over any combination of Zhao and Luka. I say this because the two documents described very different processes. As a result, I do not believe there is any motivation to combine any feature of Zhao with features of Luka, or vice versa.

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I declare that all the statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and that these statements are made with the knowledge that wilful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and may jeopardise the validity of the application or any patent issuing thereon...

Signature: 

Full name: MARKUS DAVID WILSON FROST

Date: 20 SEPTEMBER 2010